Alternative 16

CALFED
BAY-DELTA
PROGRAM

B-001249

Alternative 16 - Summary

Large East-Side Conveyance

Emphasis

Through construction of a large east-side Delta Isolated Conveyance facility, enhance export water quality, supply, and reliability, while reducing diversion effects on fish.

Distinguishing Features

This alternative is intended to provide a **high** level of resource improvement and conflict resolution.

Physical/Structural	Operational/Management	Institutional/Policy
• Isolated conveyance facility around eastern and southeastern edges of the Delta to serve multiple users including the SWP and CVP • New screened diversion on Sacramento River • New storage downstream of the Delta • High level of habitat restoration in the Bay, the Delta, and in the Sacramento and San Joaquin Rivers • Screens on all priority diversions • Bypass facility at Old River • High level of levee improvements	• Manage reservoirs to provide improved flows and temperatures for fish • Maintain Delta out-flow to protect species of concern. • Real-time monitoring to reduce entrainment • Obtain 100,000 AF on San Joaquin River and manage for environmental purposes • Pollutant source controls and enforcement for agricultural drainage, establish water quality BMPs, pest control, and remediate on-site mine drainage	• Funded levee improvements, emergency management plan, and landside buffer zones to reduce system vulnerability • Institutional mechanisms to implement water transfers

Benefits

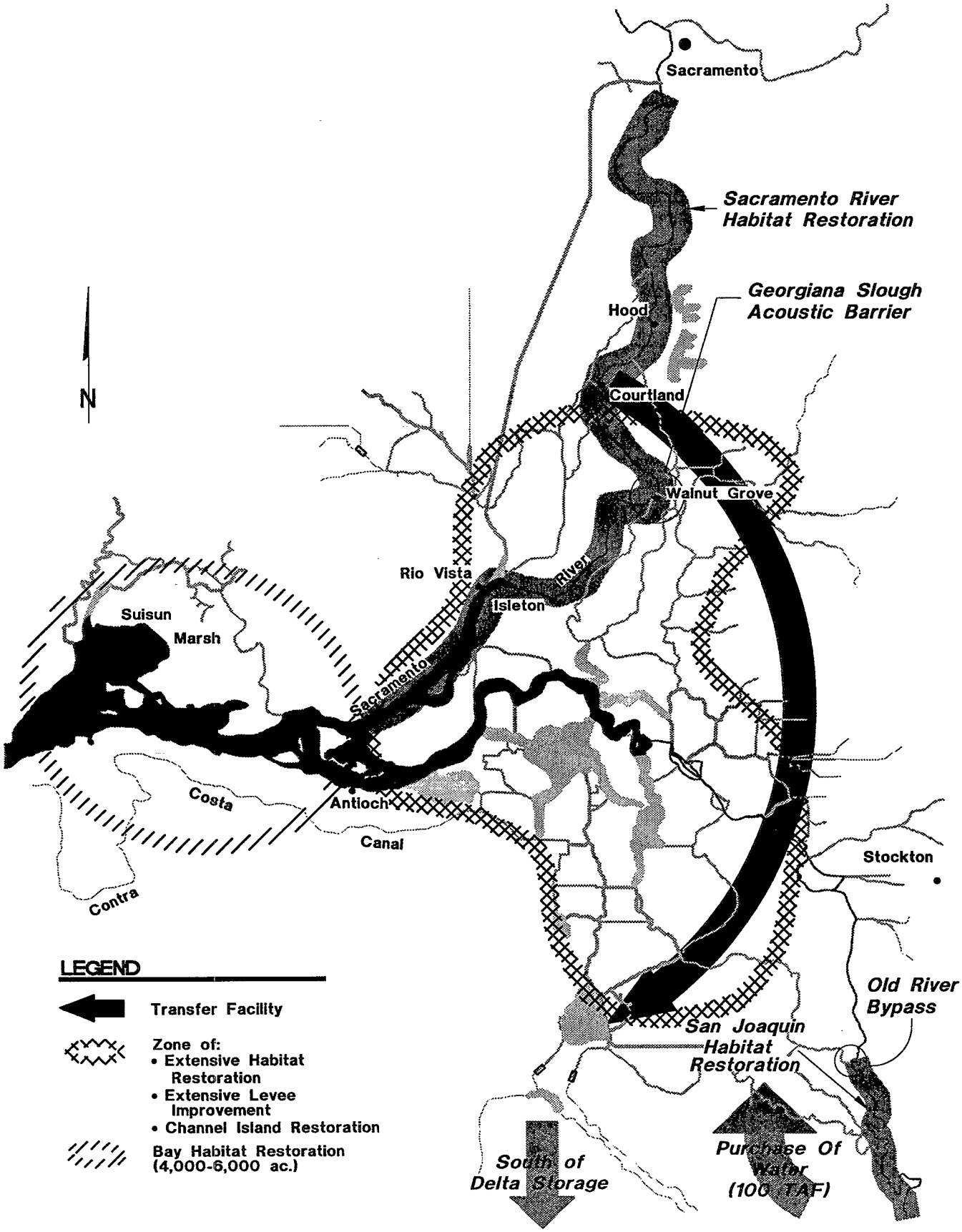
- Significantly improves water supply predictability and reliability
- Funded levee program significantly decreases vulnerability to catastrophic failure
- Habitat restoration, increased environmental flows, and reduced impacts of diversions improve ecosystem health and restore fishery
- Reduces upstream contaminants through source control and export water quality by isolating flows

Constraints and Concerns

- Environmental impacts associated with new storage reservoirs and conveyance facilities
- Bay habitat restoration could result in loss of terrestrial habitat
- Potential diversion effects at new diversions
- Potential water quality degradation in Delta
- Adverse hydrological conditions continue in Delta due to south Delta exports
- Some Delta islands remain vulnerable to flooding
- Larvae of some important fish species remain vulnerable to entrainment

Large East-side Conveyance

Alternative 16



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CALFED BAY-DELTA PROGRAM

B-001251

Alternative 16
Large East-Side Conveyance

Overview

This alternative will reduce fish entrainment in the Delta and upstream by restructuring the Delta system. Diversions will be moved to a less environmentally sensitive location, reducing fish losses. Extensive habitat restoration will further increase fish populations.

diversions are relocated to protect fish

Currently, the SWP and CVP pumps create reverse flows that move fish into the South Delta, where many of the fish are entrained. Under the ESA, limits are set on fish entrainment (take limits) to avoid jeopardizing fish populations. When these limits are approached, pumping is temporarily reduced or stopped. The constant threat of a temporary pumping reduction or shut-down makes it difficult for water users to predict or rely on their supply. This alternative moves the SWP and CVP diversions to the Sacramento River. This will reduce reverse flows and cause fewer fish to be drawn into the South Delta and killed. Also, maximum levels of habitat restoration and fish screening will improve overall ecosystem health and further increase fish populations. Consequently, larger fish populations will make ESA take limits less of a factor in water supply operations, not only for the SWP and CVP, but for all water users in the Sacramento and San Joaquin Basins.

saving fish improves water supply reliability

The SWP and CVP diversions will be relocated from the South Delta to the Sacramento River near Hood. The new diversion will be equipped with state of the art fish screens and real time monitoring to minimize entrainment of fish. A new canal, which will be isolated from the Delta, will be constructed to convey water from the new diversion to the existing Banks and Tracy Pumping Plants. The isolated facility will be sized to provide water service to users in Sacramento County, San Joaquin County and the Bay Area as well as the CVP and SWP. While the new diversion location will improve water quality for most users, certain Bay Area users may find this water quality unacceptable.

diversions moved to the Sacramento River and connected to the existing pumps with a new canal

This alternative will extensively restore habitat upstream of the Delta in the Sacramento and San Joaquin systems by constructing meander belts and restoring channel features to improve spawning success and survival of anadromous fish. Maximum habitat restoration in the Delta will include improvement of shallow riverine and riparian habitats to improve conditions for anadromous fish. Extensive levee improvements will incorporate habitat restoration. Substantial shallow tidal habitat will be developed in Suisun Marsh to benefit migrating salmon and provide spawning and rearing areas for Delta Smelt.

maximum habitat restoration upstream, in the Delta, and in Suisun Marsh

With the SWP and CVP diversions relocated, inflow to the Central and South Delta will be reduced, threatening water quality in these areas. A supplemental water supply purchased from San Joaquin River Basin water users will increase the flexibility of environmental releases of water, protecting water quality in the

extensive levee improvement

Central and South Delta while improving fish transport through the Delta. Additionally, overall water quality will be improved by pollutant source controls.

By improving fish habitat and increasing fish populations, ESA take limits that affect pumping operations will be less constraining, thereby improving water supply reliability and predictability. Habitat restoration simultaneously reduces system vulnerability and protects overall water quality.

water purchases to protect water quality and improve fish transport

Physical and Structural Features

Water Transport

Activities	Benefits
• **Relocate SWP and CVP diversions** to the Sacramento River near Hood • Construct **isolated conveyance facility** on east side of Delta connecting the new diversions to the Banks and Tracy Pumping Plants • Construct screened diversion to divert flows into isolated conveyance facility	• Reduces fish entrainment • Improves water quality for export users
• Construct tide gates and/or flow barriers in south Delta	• Better manage flow circulation • Increase water stages for south Delta diversions

Considerations

- Site diversions and conveyance facility to provide supplemental supplies to EBMUD and San Joaquin County.
- Diversion at a location upstream of the Delta such as near Hood or Freeport, sited to minimize intrusion into native fish habitat.
- Use best available screening technology and real-time monitoring to minimize fisheries impacts.
- Siphons will carry conveyance facility beneath existing Delta channels to avoid environmental, water quality, and flood conveyance impacts.
- Investigate the feasibility of multiple smaller diversion sites to improve operational flexibility and the ability to respond to fishery concerns.
- Operation of barriers coordinated with in-Delta and anadromous fishery needs through real-time monitoring.

Habitat Restoration

Activities	Benefits
• Restore riparian, shaded riverine, and shallow water habitat along the **Sacramento River channel** between Sacramento and Collinsville	• Provides substantial improvement in aquatic habitat as well as improvements in water supply reliability and water quality • Increases survival and spawning success of anadromous and Delta native fish

Activities	Benefits
• Restore **upper Sacramento River** habitat and natural channel functions	• Increases survival and spawning success of anadromous fish
• Restore **Delta and floodway corridor** shallow water, riparian, terrestrial, and tidal wetland habitat • Restore approximately 75 to 125 miles of shallow water, riverine, and riparian habitat along **Delta levees**	• Provides spawning areas for Delta native fish and forage areas and escape cover for juvenile salmon, Delta smelt, splittail, and other species. Provides improvements in water supply reliability and water quality
• Restore and protect **channel islands** from erosion and enhance habitat	• Provides habitat for aquatic and terrestrial plant and animal species • Improves water quality
• Restore about 4,000 to 6,000 acres of tidal wetlands in **Suisun Bay**	• Provides wet-year spawning habitat for Delta smelt, rearing areas for salmon, and wildlife habitat (e.g. canvasback and redhead ducks)
• Restore riverine channel features in the **San Joaquin River** above the Delta to lower water temperatures and reduce predation	• Improves fish survival

Considerations

- **Sacramento River Channel** –Feasible and cost-effective habitat restoration implemented between Sacramento and Collinsville.
- **Upper Sacramento River** – Create meander belts where feasible (e.g., Red Bluff to Colusa) and riparian sections in other areas (e.g., Colusa to Knights Landing).
- **Delta** – Candidate areas for shallow water habitat restoration include Prospect Island, Liberty Island, Little Holland Tract, Hastings Tract, Yolo Bypass, and the southeast Delta. Candidates for Delta levee habitat restoration include Twitchell Island along Threemile Slough and Sevenmile Slough, Georgiana Slough, and the North and South Forks of the Mokelumne River.
- **Floodway Corridors** – Habitat restoration must not impair capacity of floodways.
- **Suisun Bay** – Convert diked wetlands or create tidal wetlands with dredge spoils between Collinsville and Carquinez Strait.
- **San Joaquin River** – Confine wide, shallow channels and isolate in-channel gravel quarry areas. May not be self-sustaining.

Water Storage

Activities	Benefits
• **Increase storage** south of the Delta by approximately 500,000 - 1 million AF	• Allows diversions to be reduced during times of greater environmental sensitivity, and increased at times of reduced environmental sensitivity

Considerations

- Potential water savings from isolating diversions may provide additional water to beneficial users.

Fish Protection and Transport

Activities	Benefits
• Construct a **San Joaquin River bypass** at the head of Old River	• Encourages outmigrating fish to stay in the San Joaquin River • Allows for managing flows down Old River
• Install **fish screens** on all priority diversions in the Delta, rivers, and tributaries	• Reduces entrainment of fish
• Improve drainage in **floodway corridors**	• Reduces fish stranding
Considerations	
• Select diversions for screening according to criteria including size of intake, location, peril to fish, and screening feasibility.	

Flood Protection and Levee Stabilization

Activities	Benefits
• Provide a **high level of protection and stabilization** of Delta levees	• Manages vulnerability of Delta land use and infrastructure • Manages vulnerability of Delta water supply to salinity intrusion • Manages vulnerability of Delta ecosystem functions • Provides opportunities for habitat restoration
• **Increase flood conveyance capacity** of Delta channels through channel maintenance, improvements, and enlargements	• Manages vulnerability of levees to failure • Increases flood conveyance • Provides opportunities for habitat restoration
Considerations	
• Provide flood protection equivalent to Army Corps of Engineers PL 99 standard for these islands: All critical western islands such as Bethel Island. All islands with important regional infrastructure (e.g., Mokelumne Aqueduct) such as Woodward Island. All islands with valuable habitat such as Mandeville Island. • Upgrade all other Delta levees to meet at least the Hazard Mitigation Plan (HMP) standards. • Integrate protection and stabilization of levees with Delta habitat restoration activities. • Provide stable funding mechanism for ongoing levee and habitat monitoring, maintenance, and management. • Improvements and enlargements to channels include setback levees in channels with restricted flood capacity.	

Operational and Management Features

Water Diversion Management

Activities	Benefits
• Acquire about **100,000 AF** of water from willing sellers in the **San Joaquin** basin	• Transports fish through the San Joaquin River and Delta • Improves water quality • Improves management flexibility for diversions to reduce fish loss
• **Improve CVP and SWP operations** through predation control, coordinating operations, and improving fish salvaging and handling	• Reduces fish losses
• Improve **real-time monitoring** of locations of special-concern fish species and modify water diversions to avoid entrainment	• Provides an additional tool to help reduce entrainment of special-concern species • Improves flexibility to divert water during critical fish migration periods
Considerations	
• Can use San Joaquin environmental water for pulse flows to transport fish or for diluting poor quality flows. • Coordinate use of San Joaquin environmental water with the operation of new south Delta storage to improve timing of diversions.	

Fisheries Management

Activities	Benefits
• **Mark salmon** produced in hatcheries	• Facilitates selective catch of hatchery salmon by commercial and recreational fisheries
Considerations	
• Actions are intended to maintain recreational and commercial fisheries as well as enhance native salmon stocks. • Need to assess impact of incidental mortality on native (unmarked) fish.	

Water Quality Management

Activities	Benefits
• Control agricultural, urban, and industrial discharges through **retention and timed release**	• Improves Delta water quality
• Increase enforcement of source control regulations for **agricultural drainage** and implement farming best management practices for water quality	• Improves Delta water quality

Activities	Benefits
• Increase enforcement of source control regulations for **urban and industrial runoff** and implement best management practices for water quality	• Improves Delta water quality
• Integrate existing **land retirement and fallowing** programs for agricultural lands with drainage problems	• Improves Delta water quality • Provides potential land for habitat benefit
• Integrate existing and support appropriate on-site **mine drainage remediation** measures to the maximum extent feasible	• Improves Delta water quality

Considerations

- Implement discharge retention through cost-effective actions such as constructed wetlands, underground pipe storage, temporary storage ponds, or reuse.
- Time agricultural and industrial releases to coincide with higher instream flows.
- Identify priority pollutant sources such as Iron Mountain Mine and west-side San Joaquin agricultural lands.
- Provide regulatory and institutional incentives for implementation of remediation measures.

Institutional and Policy Features

Habitat Programs

Activities	Benefits
• Integrate recommended **habitat restoration actions from other programs**, including CVPIA and the Anadromous Fish Restoration Program	• Provides additional habitat restoration
• Establish programs to **preserve agricultural land uses** that provide valuable habitat functions	• Protects existing habitats
• Establish a CALFED team to coordinate and **expedite habitat restoration permits**	• Accelerates acquiring permits for environmental restoration projects and other CALFED projects
• Establish and fund a management program and rapid response team to **manage introduced species**	• Protects existing valuable species and habitat
• Establish a program to identify and use clean **dredge materials** from the Delta for habitat restoration and levee maintenance in the Delta	• Provides materials for habitat and levee improvements
• Encourage farmers and levee maintenance districts to **leave habitat areas undisturbed** by working with resource agencies	• Protects existing habitats • Increases flexibility in maintenance programs
• Implement a **subsidence management program** to reverse decline in levels of Delta islands	• Provides a long-term increase in stability of Delta levees and reliability of Delta functions • Provides wetlands that benefit wildlife

Considerations
• Coordinate activities to avoid duplication.
• Successful program for reversal of subsidence would include converting agricultural use of appropriate deep Delta islands to wetlands.
• Management of less deeply subsided areas could include rotation of seasonal wetland with wildlife-friendly agricultural practices.

Water Quality Standards

Activities	Benefits
• Reevaluate **Delta export/inflow ratios** during triennial reviews as habitat effectiveness is realized	• Allows for higher level of water transfer based on actual fish population improvements
Considerations	
• Monitor to verify effectiveness of habitat and entrainment reduction programs. Develop an adaptive management program and modify habitat restoration and export/inflow ratios in response to improved sustainability of important species.	

Management of System Vulnerability

Activities	Benefits
• Establish and fund an **emergency levee management plan** to respond to levee failures	• Provides resources to protect Delta functions through proactive and preventative measures
• Establish **landside buffer zones** adjacent to levees on islands with deep peat soils	• Provides increase in stability of Delta levees and reliability of Delta functions by reducing subsidence adjacent to levees • Could be used to provide habitat benefit
Considerations	
• Determine extent and cost effectiveness of levee management programs and buffer zones. • Buffer strip approximately 150 to 200 yards wide dedicated to shallow wetlands. Buffer strip could be used as part of subsidence management program.	

Preliminary Assessment

Benefits

- Significantly improves water supply predictability and reliability
- Funded levee program significantly decreases vulnerability to catastrophic failure
- Reduces upstream contaminants through source control and export water quality by isolating flows
- Improves ecosystem quality through habitat restoration and decreased diversion impacts

Constraints and Concerns

- Environmental impacts associated with new storage reservoirs and conveyance facilities
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